

[METHOD FOR FABRICATING MEMORY DEVICE HAVING A DEEP TRENCH CAPACITOR]

Abstract

A method of fabricating a memory device having a deep trench capacitor is described. A first conductive layer is formed in the lower and middle portions of a deep trench in a substrate. An undoped semiconductor layer is formed in the upper portion of the deep trench. A mask layer is formed on the substrate, wherein the mask layer covers the periphery of the undoped semiconductor layer that is adjacent to the neighboring region, pre-defined for the active region of the deep trench. An ion implantation process is performed to implant dopants into the undoped semiconductor layer exposed by the mask layer so as to form a second conductive layer. The first and the second conductive layers constitute the upper electrode of the deep trench capacitor.